Acknowledgements

The Augmented Reality Sandbox is presented by the Michigan Water Stewardship Program and Tri-County Regional Planning Commission in partnership with the Eaton Conservation District and Greater Lansing Regional Committee for Stormwater Management. Programming was made possible through the Mid-Michigan Watershed Connections Project via the Great Lakes B-WET 2022 Grant with technical assistance from Jordan Shedd.

The ARS was developed by the UC Davis W.M. Keck Center for Active Visualization in the Earth Sciences (KeckCAVES, www.keckcaves.org), supported by the National Science Foundation under Grant No. DRL 1114663. For more information, visit www.web.cs.ucdavis.edu/~okreylos/ResDev/SARndbox/.

Watershed Education

Visit www.MIWaterStewardship.org and www.mywatersheds.org for ARS lesson plans, scheduling information, and local events.

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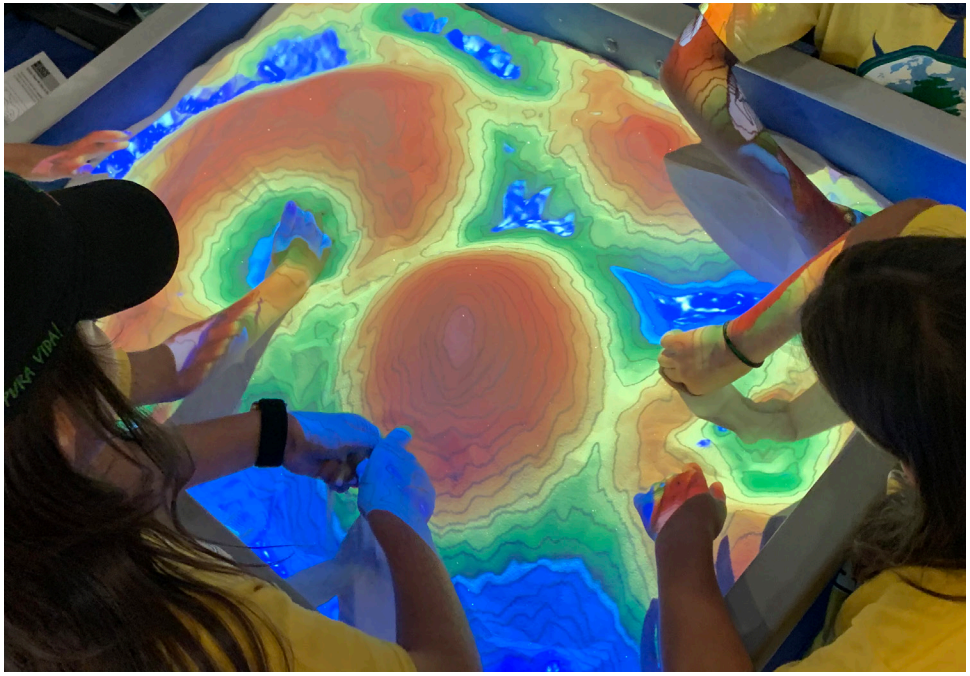
mywatersheds.org

Augmented Reality Sandbox

A partnership in watershed education



What Does the Augmented Reality Sandbox (ARS) Do?

- Helps us understand where water flows and how watersheds work
- Teaches earth science, environmental science and geological, geographical, and hydrological concepts
- Creates topographical models with contour lines and simulated water
- Demonstrates human impact on our environment
- Provides hands-on learning and discovery for all ages

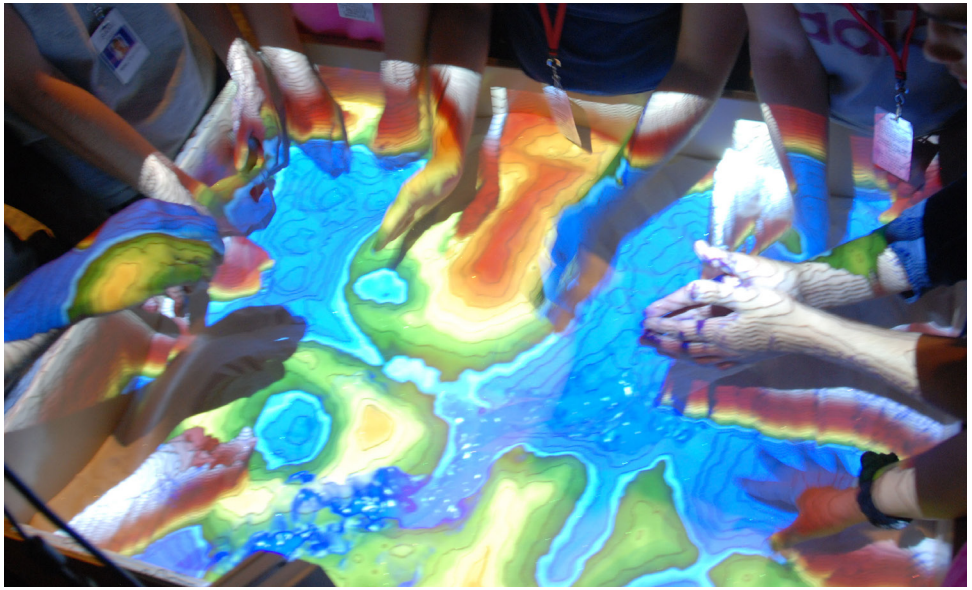
How Does the ARS Work?

The ARS uses 3D technology to help us learn about our watershed. As we move the sand, we can see a topographical map change with the movement. We can simulate rainfall and see how water flows over the surface and where it settles.

We can view the movement of water by using a computer projector and a motion-sensing input device (an Xbox 360 Kinect camera) mounted above the sand. The camera is calibrated to detect the 3D landscape of the sand and the height of the "raincloud" to start the rain.

Open source software developed by UC Davis in California instantly simulates and projects a topographical and hydrological model as users create landscapes and move water in the hands-on sandbox.

How to Play and Learn



- **Dig and Build!** See if you can make rivers, lakes, mountains, plains, or islands!
- **To Make Rain:** Hold your hand flat with your fingers spread out about 10" above the sand

Hands-on Discovery With the ARS

Watersheds and Water Movement

A watershed is an area of land which drains to a particular body of water.
The shape of the earth's surface (topography) defines watershed boundaries.
Water moves faster down steep slopes and slower down gradual slopes.

Watershed graphic credit: Stormwater Management Commission Lake County, IL.

Topographical maps show the elevation of the land by using contour lines. The contour interval (space between contour lines) represents the vertical distance between two contour lines. The closer the line, the steeper the slope.

Think About It!

- **What landforms can you make in the sandbox?**
- **How do the contour lines change based on the landform you create?**
- **What landforms would define watersheds? Can you make a watershed in the sandbox?**
- **You live in a watershed! What do you think it looks like? Where does your water drain?**
- **What would happen to your watershed if it was polluted? What about the watershed downstream?**